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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/660,350	09/11/2003	Zhang Xumu	823.0111USV	5131
7590 03/11/2004				
Paul D. Greeley, ESQ. OHLANDT, GREELEY, RUGGIERO & PERLE, L.L.P. 10th FLOOR ONE LANDMARK SQUARE STAMFORD, CT 06901-2682			EXAMINER VOLLANO, JEAN F	
			ART UNIT 1621	PAPER NUMBER

DATE MAILED: 03/11/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/660,350

Applicant(s)

XUMU, ZHANG

Examiner

Jean F. Vollano

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 48-103 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 49,50,59-61,63,64,67,68,70,71 and 79-103 is/are rejected.
- 7) ☒ Claim(s) 48,51-58,62,65,66,69 and 72-78 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____.
- 4) ☒ Interview Summary (PTO-413)
Paper No(s)/Mail Date. 3/4/2004.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

Priority

1. This application filed under former 37 CFR 1.60 lacks the necessary reference to the prior application. A statement reading "This is a divisional of Application No. 09/991,261, filed November 11, 2001." should be entered following the title of the invention or as the first sentence of the specification. Also, the current status of all nonprovisional parent applications referenced should be included.

The priority information in the first sentence only contains reference to the two provisional applications and not to the parent. Please make appropriate correction to receive priority to the parent application.

2. Claims 1-47 have been cancelled. Claims 48-103 are pending.

Restriction/Election

3. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 48-103 (in part), drawn to catalysts of the formula in claim 48 wherein the Y is a CH₂ or a bond with a transition metal and the method of using the catalyst , classified in class 568, 556 502, subclass various.
 - II. Claims 48-103 (in part), drawn to a catalysts of the formula in claim 48 wherein the Y is O with a transition metal and the method of using the catalyst , classified in class 558, 556, 502 subclass various.

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- III. Claims 48-103 (in part), drawn to a catalysts of the formula in claim 48 wherein the Y is S with a transition metal and the method of using the catalyst classified in class 558, 556, 502 subclass special thioester subclass.
- IV. Claims 48-103(in part), drawn to a catalysts of the formula in claim 48 wherein the Y is NH with a transition metal and the method of using the catalyst, classified in class 564, 556, 502 subclass various.

The inventions are distinct, each from the other because of the following reasons:

The catalysts in Group I are phosphines which have properties of the metal phosphine complexes whereas the compounds in Group II are drawn to phosphorus esters with an O-Phenyl group attached to the phosphorus. They are chemically and physical different from phosphines. Finding a 102 rejection over a metal phosphine catalyst and the method of using the catalyst would not obviate a rejection over the metal phosphorus ester catalyst and its method of use. They are patentably distinct and there is a burdensome search since the catalysts are not found in the same class and subclass. Group III is drawn to thiophosphorus esters which again are different from the oxygen esters and the phosphines both chemically and physically. Group IV is drawn to amide phosphorus compounds which again are different from the above Groups. The groups meet the requirement of being patentably distinct and there is a burdensome search both in classes and subclasses and in a structure drawing and word search in CAPLUS in chemical abstracts.

Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr Vazken Alexanian for Mr Paul Greely on March 4, 2004 a provisional election was made with traverse to prosecute the invention of Group I, claims 48-103 (in part). Affirmation of this election must be made by applicant in replying to this Office action. There are no claims in full withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 112

Claims 71 and 82-103 rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the asymmetric reactions defined in claim 72, does not reasonably provide enablement for any asymmetric reaction known. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to use the invention commensurate in scope with these claims. The invention is using a specific transition metal catalyst for the preparation of compounds in different asymmetric reactions. There is a list of those reactions in which the catalyst works in claim 72. However one of ordinary skill in the art knows that catalyst are notoriously unpredictable and in one reaction and under given reaction conditions a transition metal complex of a phosphine compound may be a catalyst and in another asymmetric reaction it may not be a catalyst. Or the reaction conditions may be such to make it have any catalytic activity that a series of experiments must be performed to see if the supposed complex has any catalytic activity and under what circumstances (i.e. chemical conditions- solvent/ reagent ratio etc) it can be used as a catalyst for the reaction. Nor is the information found from one reaction applicable to any other reaction per se. There would

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have to be undue experimentation to determine what asymmetric reactions outside of what is found in the specification (i.e. claim 72) that the complexes could be used as a catalyst .

The scope of the claim is broader than the scope of the enablement and it would take undue experimentation to use the metal complex compounds to the scope being claimed. This rejection can be overcome by limiting the reactions to those found in claim 72.

4. Claims 49, 50, 59-61, 63-64, 67-68, 70, 79, 80, 81, 93 94 , 96 , 100, 101 and 103 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The examiner notes that in claim 48 page 3 there is a miss typing of "arelene" which it is assumed should be - - arylene- -.

Claim 49 recites the limitation of "said substituted alkyl ". Claim 50 recites the limitation of " said alkylene", claim 51 recites the limitation of "each of said aryl groups optionally" and claim 52 recites "each of said arylene optionally". Now the confusion arises not in claim 51 or 52 but in claim 49 and 50 since they do not say "each or said" and there are more than one substituted alkyl positions and alkylene positions. If there are more than one and the limitation does not state "each of said..." then which "said" group is the limitation of claim 49 and 50 referring to ? If the limitation is referring to all the substituted alkyl groups and alkylene groups then that should be clearly defined as it is in claims 51-52. However there is a different problem with claim 51 and 52.

Claim 59 has a couple of structures on page 5 the third row of compounds wherein the A's are in space and not attached to any bonds. Please correct. The same problem occurs in claim 60.

In claim 48 there is a proviso that when the "Y group at the 2' position is a bond between carbon and phosphorus, X' is hydrogen".

Claim 61 recites the limitation of the "catalyst of claim 48, wherein said ligand is selected from the group consisting of ... " followed by a large number of formulas. However in the formulas there are many compounds with bonds to the phosphorus at the 2' position but X' is not hydrogen. So there are compounds in claim 61 that do not meet the limitation of the claim they are dependent on. However if the compounds are specifically found in the specification and they are described in the specification as part of the instant invention then those specific structures do have support and could be independently claimed. Claim 63, 64, 70, 79, 94, 96 and 103 have the same problem.

Claim 67 recites letters for various groups such as DBA, COD, NBD, acac, etc which are not defined in the claims or the specification that the examiner can find. COD is commonly known as cyclooctadiene, acac is commonly known as acetylacetone or more properly as 2,4 pentadione, Tf is triflate and as such can be placed at the end for a definition but the examiner does recognize COT, NBD, DBA, cymen immediately. The claim is confusing as to the metes and bounds as defined by the complexes. In claim 67 there is a $\text{Ru}(\text{COD})_n$. However n is not defined. Stoichiometrically for active Ruthenium II it would be 2 but there is an less active Ruthenium III. Or is it Ruthenium 0? Since if it were II or III there should be a charge on the molecule since COD is not an anion but a neutral donor? There are X in the formulas which

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state that X is a counteranion? It is unclear what the metes and bounds of this term is? One group is AgX. Does this mean that there is no covalent bond between Ag and X? Or does this counter anion mean that the limitation is to any anion that makes the transition metal complex form a neutral species? How does this differ from PtCl₂ which by definition of the claim is a transition metal salt? These are complexes or salts being used in the instant invention and as such they should be clearly and concisely defined so that one knows the metes and bounds of the limitations. Also there is a group which is RuX₂(L)₂. L is not defined. Me Re O₃. is Me methyl? If so a CH₃ would be clearer. If not what does Me refer to? There is Ruthenium complex which as (arene) in it which is probably pi bonded to the Ruthenium. Then next to it is an Ru(aryl group). How does this differ from the arene? Or is it the same? And how do they both differ from Ru(Ar H) which is an aryl group or an arene? Please be consistent in the nomenclature. These are some of the problems with this claim please review the claim and clarify the different problems. The same problem occurs in claim 70. Also in claim 70 dba is in small letters is this different from DBA in claim 67? Claim 96 and 103 have the same problem

Claim 67 recites the limitation of counteranion and then gives examples including fluorophenyl. Is fluorophenyl a counteranion? Is it an anion? If it is please clarify and if it is then is it the same as the aryl group in claim 67 since an aryl group can be a phenyl? However the aryl group is not the counteranion in claim 67 for examples Ru(aryl group) X₂ is a structure wherein X is the counteranion. But Aryl group is there and seemingly not the counter anion. But in claim 67 a phenyl group which is a subset of aryl group is being claimed as the counter anion. This is very confusing as to the metes and bounds that are being claimed in the instant invention. Claim 101 has the same problem.

Claim 93 recites the limitation of "X" is independently selected from the group consisting of hydrogen, alkyl, aryl ...". All the structures in claim 93 have carbon phosphorus bonds which means no CH₂ groups. The limitation in claim 72 from which this claim depends has a proviso that when Y at the 2' position is a bond between the carbon and phosphorus then the X' has to be hydrogen. Therefore is unclear with all the structures having Y in the 2' position as a bond how X' can be anything but hydrogen? The claim is confusing as to the metes and bounds that are being claimed as the instant invention.

5. Claims 48, 51-58, 62, 65-66, 69, 72-78 are objected to as containing non elected subject matter.

In reference to the confusion in the proviso. The examiner notes that although claim 60 does not have the proviso, per se, it is dependent on claim 48 and therefore the proviso is part of the claim.

US 4,578,462 teaches the manufacture of optically active compounds using catalysts of transition metals, which are formula III in column 1 which generically meet the limitations of the claimed catalysts if R₇ is in the ortho position to the phosphorus and n is at least one. (it can be zero) and R₅ and R₆ are not hydrogen (they can be hydrogen or other moieties). However the teaching of the compound only has one species that is taught specifically and it is (3, 3'-dimethyl[1,1'-biphenyl] 2,2'-diyl) bis[diphenylphosphine] which is not part of the instant invention-see sheet attached to US4,758,462.

US 5,710,339 teaches transition metal catalysts for hydrogenation similar to the ones used in the instant invention. However there is no group ortho to the Y bond in the phosphorus.

US 6,583,312 teaches transition metal catalyst and their use in catalytic hydrogenation. The compounds found in column 14, lines 45-60 are similar to the compounds being claimed except that they do not have a Group ortho to the Y bonded phosphorus as required in the instant invention. They do have a hydrogen ortho to the Y'bonded phosphorus.

US 6,515,183, US 5,872,273 and US 6,333,291 teach heterocyclic ring structured biphenyl bis phosphine transition metal catalysts and their reactions in asymmetric synthesis (e.g. hydrogenation) but there are no X groups which is required.

US 6,075,154 teaches transition metal catalysts which have a CF₃ in the Z and Z' position of the instant catalyst but there is no ligand in the X position as required.

US 5,922,918 teaches transition metal catalysts which are bis phosphines and used in isomerization hydrosilylation, hydrogenation but the rings are unsubstituted which does not fit the requirements of the instant invention.

US 5,847,222 teaches transition metal catalysts which are substituted biphenyl phosphines and have an alkyl group in the Z and Z' position but no group in the X position as required.

CA:139:214664 teaches transition metal catalysts which are similar to those of the instant invention except that X' is a methyl group and that is provisoed out. Also the date precludes the reference from being prior art.

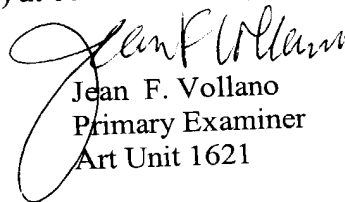
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jean F. Vollano whose telephone number is 571-2720648. The examiner can normally be reached on Monday-Thursday 6:30 - 5:00.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Johann Richter can be reached on 571-272- 0646. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jean F. Vollano
Primary Examiner
Art Unit 1621

March 7, 2004